

## REMARKS

Claims 1-18 and 22-83 are pending and under examination in the application. Claims 8-18, 22, 27-32, 50-51, 61-66 and 79 have been amended to overcome the rejections for indefiniteness under 35 U.S.C. § 112, second paragraph by deleting certain uses of the terms "approximately" or "about." No new matter has been introduced by these Amendments.

### **I. Rejections under 35 U.S.C. § 112**

Claims 8-18, 22, 27-32, 50-51, 61-66 and 79 stand rejected under 35 U.S.C. § 112, second paragraph for allegedly failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Although applicants do not agree with or concede the merits of these rejections, claims 8-18, 22, 27-32, 50-51, 61-66 and 79 have been amended as set forth above to overcome these rejections.

### **II. Rejections under 35 U.S.C. § 103**

Claims 1-18 and 22-83 stand rejected as allegedly being obvious and unpatentable under 35 U.S.C. § 103(a) based on a number of grounds. As set forth in detail below, Applicants respectfully submit that these rejections are in error and should be withdrawn.

#### **A. Rejections in view of U.S. Patent No. 4,173,627 (hereinafter "Madrangle")**

The Office Action has rejected Claims 1-18, 22-32, 36-53, 57-59, 61-62 and 73-83 as allegedly being obvious and unpatentable over the disclosure of Madrange alone and, alternatively, over the disclosure of Madrange further in view of Japanese Patent Abstract JP 08187277 (hereinafter "JP '277"). To that end, it is well established in law that to present a *prima facie* case of obviousness an Examiner is burdened with showing the art relied upon in the rejection teaches, or at least suggests, the claimed invention as a whole. Moreover, the Examiner must also identify the adequate motivation and a

reasonable expectation of success for one of ordinary skill in the art to undertake the modifications proposed in the rejection. For the reasons set forth below, Applicants respectfully submit that the instant rejections fail to satisfy these requirements.

As previously presented, Applicants' independent claims 1 and 80 each recite a composition comprising, in part, at least 10% by weight methyl acetate and 20% to 55% by weight of an alkanol component comprising ethanol. Neither Madrange nor JP '277, alone or in any combination, teach or even suggest this combination much less provide the requisite motivation and expectation of success required to support these rejections.

Madrange discloses a hair care composition containing at least one of: (a) a lower alkanol, such as ethanol, propanol, isopropanol or butanol; (b) a solvent such as 1,1,1-trichloroethane and methylene chloride; and (c) a diluent such as a ketone, in particular acetone and methylethyl ketone; an alkyl acetate, in particular methyl acetate or ethyl acetate, or a hydrocarbon, in particular a C<sub>3</sub>-C<sub>7</sub> alkane. Although at least one of the three components (a), (b), or (c) is present in the composition, Madrange makes clear that none of components (a), (b) or (c) is required. See Col. 3, lines 48-52. Furthermore, although Madrange does disclose ethanol and methyl acetate individually, it does not teach or suggest the claimed combination of ethanol and methyl acetate.

In support of the rejection, the Examiner again relies initially upon Example 1 of Madrange which discloses an exemplary composition comprised of isobutane and ethanol. In particular, the Examiner suggests it would have been obvious for one of ordinary skill in the art to substitute methyl acetate for the isobutane component because Madrange teaches generally that the diluent can also be methyl acetate. Notably absent from this rejection however is the identification of a suggestion, teaching or motivation that would lead one of ordinary skill in the art to actually make the Examiner's proposed substitution. Applicants do not dispute that Madrange discloses methyl acetate as a possible diluent. What Madrange fails to teach or suggest and therefore the Examiner

has failed to establish, is not whether methyl acetate can be used but rather, whether the claimed combination of methyl acetate and ethanol can be used.

The Examiner also relies upon M.P.E.P. section 2123 for the premise that "Patents are Relevant as Prior Art for All They Contain." However, this section is not a license to merely extract two components, namely "methyl acetate" and "ethanol," from a number of possible ingredients and combinations and then suggest they could be combined in a first step toward solving the problem identified by Applicants. In fact, to modify a prior art reference without evidence of such suggestion, teaching or motivation is an impermissible hindsight reconstruction and simply takes the inventor's own disclosure as a blueprint for piecing together the prior art in an effort to defeat patentability. Thus, the motivation to modify the teaching of a reference cannot come from the Applicants' own invention. Simply put, there is no teaching or suggestion in Madrange that would motivate one of ordinary skill in the art to arrive at a hair care composition comprising the claimed combination of methyl acetate and ethanol and, as such, any rejection of the instant claims in view of Madrange should be withdrawn.

In an alternative rejection, Claims 1-18, 22-32, 36-53, 57-59, 61-62, and 73-83 were also rejected under 35 U.S.C. §103(a) as allegedly being obvious over Mandrange further in view of JP 08187277 (hereinafter "JP '277"). In particular, the Examiner contends that it would have been obvious for the skilled artisan to utilize the combination of methyl acetate and ethanol in the composition of Madrange because JP '277 teaches that methyl acetate can mask the odor of lower alcohols in a cosmetic composition. To that end, even assuming *arguendo* that one of skill in the art would have combined the disclosures of Madrange and the JP Patent Abstract as proposed in the instant rejection, the combined teachings still fail to arrive at the composition recited in the instant claims wherein the methyl acetate is present in an amount of at least 10 weight percent of the composition.

JP '277 discloses the use of methyl acetate as a masking agent to mask the allegedly irritating odor of an alcohol component in cosmetic compositions. In particular, JP '277 specifically states that "the concentration of the masking agent capable of effectively exhibiting the action is 0.1-10 wt.%, more preferably 0.5-5 wt.% based on the alcohol." Thus, JP '277 teaches that the effective amount of methyl acetate set forth above is determined relative to the weight of the alcohol component alone and not relative to the total weight of the composition. Furthermore, JP '277 also states that the solvent effect of the lower alcohol component may be compromised if the amount of the masking agent exceeds 10 wt% of the alcohol component and therefore teaches away from using methyl acetate in any amount exceeding 10 wt% relative to the weight of an alcohol component. Since, Applicant's independent Claims 1 and 80 recite compositions comprising 20 wt% to 55 wt% of an alkanol component, the guidance of JP '277 teaches that the highest concentration of methyl acetate that could effectively be used would be 5.5 wt% of the total composition (*i.e.*, 10 % of the 20 wt% to 55 wt% alkanol component). Therefore, even if one of ordinary skill in the art would have combined these teachings as proposed in the rejection, the result would not provide a composition wherein at least 10 wt% of the total composition is methyl acetate as set forth in the instant claims.

In view of the specific limitations on the amount of methyl acetate that JP '277 suggests can be used, the Examiner states that JP '277 is only relied upon for the specific motivation to combine methyl acetate with ethanol in a cosmetic composition and is not relied upon for the weight percentage limitations disclosed therein. This however constitutes an improper selective reading of the reference. It is improper to pick and choose from any one reference only so much of it that will support a given position without addressing the full appreciation of what the reference would suggest to one of ordinary skill in the art. *In re Wesslau*, 353 F.2d 238, 240, 147 U.S.P.Q. 391, 393 (C.C.P.A. 1965). Therefore, if the Examiner intends to rely upon a reference such as JP '277 for its alleged teaching of methyl acetate in combination with ethanol, the Examiner must view that specific teaching in the context of the reference as a whole. As set forth

above, JP '277 explicitly states that the amount of methyl acetate masking agent that can be used to mask the odor of an alcohol in a cosmetic composition should not exceed 10 weight percent of the alcohol component. This specific amount is significantly less than the amount recited in the instant claims, *i.e.*, 10 weight percent of the total composition. To ignore this specific teaching away from the claimed amount of methyl acetate, as the instant rejection purports to do, is again evidence of an improper hindsight rejection.

Furthermore, the current rejections over Madrange alone, or further in view of "JP '277," do not appreciate the several unexpected and superior results achieved by the instant invention. First, by requiring at least 10 weight of methyl acetate, the presently claimed invention achieves the superior advantage of reducing the volatile organic compound content of the hair care composition. A volatile organic compound (VOC) is defined as any compound of carbon, which participates in atmospheric photochemical reactions. See, 40 C.F.R. 51.100 attached as appendix "A". To that end, methyl acetate has been expressly exempted from the list of volatile organic compounds. See, 40 C.F.R. 51.100. Therefore, the inclusion of VOC exempt methyl acetate in the claimed invention necessarily reduces the volatile organic compound content of the composition relative to a composition not containing a VOC exempt component. To this end, neither Madrange nor "JP '277" teach or suggest the desirability of providing a hair care composition that achieves the superior result of lowering the VOC content.

Second, the characteristic, unpleasant, odor associated with alkyl acetates, such as methyl acetate, is acknowledged in the art as a hindrance to consumer acceptance of hair care compositions. To that end, the Applicants have unexpectedly discovered that the unpleasant odor associated with methyl acetate is substantially reduced when combined with ethanol as recited in the present claims. See, attached "Second Declaration of Suzanne Dobbs" previously submitted in parent application number 09/153,644, now U.S. Patent Number 6,752,983. The disclosure of Madrange alone, or in view of JP '277, does not teach or suggest the desirability of providing a combination of

components capable of reducing the unpleasant odor associated with methyl acetate. In fact, assuming *arguendo* that one of ordinary skill in the art would even have been motivated to select methyl acetate from the laundry list of Madrange's possible components, compositions comprising methyl acetate alone or in combination with other components other than ethanol which are disclosed in Madrange (See Col. 3, lines 37-52) do not achieve the same superior and unexpected result of reducing the unpleasant odor associated with methyl acetate. See, attached "Second Declaration of Suzanne Dobbs."

Finally, Applicants have also unexpectedly discovered that ethanol inhibits the detrimental effects that methyl acetate by itself can cause to acetate fabrics. See, attached "Second Declaration of Suzanne Dobbs." Once again, the disclosure of Madrange, alone or in view of JP '277, fails to teach or suggest the desirability of providing a combination of components capable of inhibiting detrimental effects that methyl acetate can have on acetate fabrics. Assuming again for the sake of argument that one of ordinary skill in the art would have even been motivated to select methyl acetate from the laundry list of possible components set forth by Madrange, it has been shown that compositions comprising methyl acetate alone, or in combination with components other than ethanol which are disclosed in Madrange (See Col. 3, lines 37-52) do not achieve the unexpected result of inhibiting the detrimental effects methyl acetate has on acetate fabrics. See, attached Second Declaration of Suzanne Dobbs.

Therefore, not only does Madrange alone, or further in view of JP '277, fail to teach or suggest the claimed invention as a whole, there similarly is no motivation in these references for one of ordinary skill in the art to arrive at a hair care composition that achieves the superior advantages of reducing the volatile organic compound content of the composition, reducing and/or masking the characteristic, unpleasant, odor associated with alkyl acetates, such as methyl acetate, and, inhibiting the detrimental effects that methyl acetate by itself can cause to acetate fabrics. As such, in view of the arguments

set forth above, it is respectfully requested that any rejections in view of Madrange alone or further in view of JP '277 should be withdrawn.

Still further, the Office Action has also rejected several dependent claims on a number of grounds. Specifically, Claims 33-35, 56, 60 and 63-72 have been rejected under 35 U.S.C. § 103 over Madrange in view of JP 08187277, in further view of Chaung. Also, Claims 54 and 55 have been rejected under 35 U.S.C. § 103 over Madrange in view of JP 08187277, in further view of Morawsky. To that end, it is axiomatic that dependent claims are non-obvious under section 103 if the independent claims from which they depend are non-obvious. See *In re Fine*, 5 U.S.P.Q.2d 1569, 1600 (Fed. Cir. 1988). Thus, while Applicants do not concede or agree with these rejections, Applicants need not address the substantive merits of these rejections in detail because the teachings of Madrange alone, and further in view of JP 08187277, are insufficient to defeat the patentability of independent Claims 1 and 80 as discussed above. Accordingly, it is respectfully submitted that dependent Claims 33-35, 54-56, 60 and 63-72 are also allowable over the instant rejections.

**B. Rejections in view of U.S. Patent No. 4,243,548 (hereinafter "Heeb")**

The Examiner has again rejected Claims 1-18, 27-51, 56-57, 61-68 and 76-83 under 35 U.S.C. §103(a), as allegedly being unpatentable over U.S. 4,243,548, Heeb *et al.*, (hereinafter "Heeb") in view of JP '277.<sup>1</sup> In particular, the Examiner continues to acknowledge that Heeb fails to teach the claimed combination of ethanol and methyl acetate and thus relies upon the disclosure of JP '277 for its specific teaching of a composition comprising both methyl acetate and ethanol as co-solvents. For the reasons set forth below, Applicants respectfully submit that this proposed combination does not render the claimed compositions obvious.

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<sup>1</sup> Applicants note that the Office Action initially indicates in the second paragraph of page 15 that the rejections over the Heeb reference are withdrawn in light of applicants' arguments. However, the subsequent text of the Office Action continues to set forth grounds for rejection over Heeb in contradiction to the stated withdrawal of rejections. Accordingly, for purposes of this submission, applicants assume the Examiner's initial indication of withdrawal was in error.

As detailed above, JP '277 specifically teaches that the concentration of methyl acetate that can be used in combination with an alcohol is 0.1-10 wt. % and more preferably 0.5-5 wt. %, based upon on the amount of alcohol present in the composition. Thus, JP '277 teaches that the effective amount of methyl acetate set forth above is determined relative to the weight of the alcohol component alone and not relative to the total weight of the composition. Furthermore, JP '277 also states that the solvent effect of the lower alcohol component may be compromised if the amount of the methyl acetate exceeds 10 wt% and therefore teaches away from using methyl acetate in any amount exceeding 10 wt% relative to the weight of an alcohol component. Thus, following the guidance of JP '277, the highest concentration of methyl acetate that could effectively be used in the Applicant's composition would be 5.5 wt% of the total composition (10 % of the 20 wt% to 55 wt% alkanol component) and not 10 weight percent as suggested in the rejection. Therefore, even if one of ordinary skill in the art would have combined these teachings as proposed in the rejection, the result would not provide a composition wherein 10 wt% of the composition is methyl acetate as set forth in the instant claims.

Applicants would again note that any reliance upon JP '277 for its alleged teaching of methyl acetate in combination with ethanol must view that specific teaching in the context of the reference as a whole. The Examiner cannot properly select only those portions of a reference that will support a given position without addressing the full appreciation of what the reference would suggest to one of ordinary skill in the art. Therefore, if one of ordinary skill in the art were to seek the guidance of JP '277 for the combination of methyl acetate and alcohol as suggested in the rejection, the skilled artisan would only have been motivated to use the methyl acetate in the manner and amount described therein. To that end, JP '277 explicitly teaches a maximum amount of methyl acetate that can be used in combination with an alcohol without compromising the solvent effect of the alcohol. This specified amount does not exceed 10 weight percent relative to the amount of alcohol and is significantly less than the amount recited in the



instant claims, *i.e.*, 10 weight percent of the total composition. Therefore, for at least this reason, the combined teachings of Heeb and JP '277 do not render the compositions of Applicant's claims obvious and the instant rejections should be withdrawn.

Furthermore, the current rejections over Heeb in view of "JP '277" also fail to appreciate the several unexpected and superior results achieved by the instant invention and set forth in the attached "Second Declaration of Suzanne Dobbs." First, neither Heeb nor JP '277 teach or suggest the desirability of providing a combination of components capable of reducing the unpleasant odor associated with methyl acetate. Heeb discloses a formulation comprising at least one of 23 possible solvents that can be used alone or in combination. Assuming for the sake of argument that one of ordinary skill in the art would have been motivated to select methyl acetate from the laundry list of possible components, these purported compositions comprising methyl acetate alone or in combination with other components disclosed in Heeb (See Col. 2, lines 50-60) do not achieve the unexpected result of reducing the unpleasant odor associated with methyl acetate. See, attached Second Declaration of Suzanne Dobbs. Similarly, JP '277 is directed to masking the unpleasant odor associated with ethanol and does not suggest the desirability of masking the unpleasant odor associated with methyl acetate.

Second, Applicants have also unexpectedly discovered that ethanol inhibits the detrimental effects that methyl acetate by itself can cause to acetate fabrics. See, attached Second Declaration of Suzanne Dobbs. Once again, neither Heeb nor JP '277 teach or suggest the desirability of providing a combination of components capable of inhibiting detrimental effects that methyl acetate can have on acetate fabrics.

Therefore, not only does Heeb in view of JP '277 fail to teach or suggest a hair care composition providing the unexpected and superior results set forth above, but there similarly is no motivation for one of ordinary skill in the art to arrive at a hair care composition that achieves these superior and unexpected advantages. As such, in view

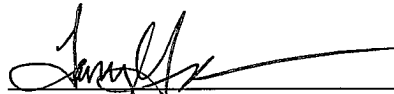
of the arguments set forth above, it is respectfully requested that any rejections over Heeb further in view of JP '277 be withdrawn.

**CONCLUSION**

In view of the Amendments and Remarks set out above, it is respectfully asserted that the rejections set forth in the Office Action of November 2, 2007 have been overcome and that the application is now in condition for allowance. Accordingly, Applicants respectfully seek notification of same.

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# Environmental Protection Agency

§51.100

## Subpart W—Determining Conformity of General Federal Actions to State or Federal Implementation Plans

- 51.850 Prohibition.
- 51.851 State implementation plan (SIP) revision.
- 51.852 Definitions.
- 51.853 Applicability.
- 51.854 Conformity analysis.
- 51.855 Reporting requirements.
- 51.856 Public participation.
- 51.857 Frequency of conformity determinations.
- 51.858 Criteria for determining conformity of general Federal actions.
- 51.859 Procedures for conformity determinations of general Federal actions.
- 51.860 Mitigation of air quality impacts.

### APPENDIXES A-K [RESERVED]

### APPENDIX L TO PART 51—EXAMPLE REGULATIONS FOR PREVENTION OF AIR POLLUTION EMERGENCY EPISODES

### APPENDIX M TO PART 51—RECOMMENDED TEST METHODS FOR STATE IMPLEMENTATION PLANS

### APPENDIXES N-O [RESERVED]

### APPENDIX P TO PART 51—MINIMUM EMISSION MONITORING REQUIREMENTS

### APPENDIXES Q-R [RESERVED]

### APPENDIX S TO PART 51—EMISSION OFFSET INTERPRETATIVE RULING

### APPENDIXES T-U [RESERVED]

### APPENDIX V TO PART 51—CRITERIA FOR DETERMINING THE COMPLETENESS OF PLAN SUBMISSIONS

### APPENDIX W TO PART 51—GUIDELINE ON AIR QUALITY MODELS

### APPENDIX X TO PART 51—EXAMPLES OF ECONOMIC INCENTIVE PROGRAMS

AUTHORITY: 42 U.S.C. 7401, 7411, 7412, 7413, 7414, 7470-7479, 7501-7508, 7601, and 7602.

SOURCE: 36 FR 22398, Nov. 25, 1971, unless otherwise noted.

## Subparts A-E [Reserved]

## Subpart F—Procedural Requirements

SOURCE: 51 FR 40661, Nov. 7, 1986, unless otherwise noted.

### §51.100 Definitions.

As used in this part, all terms not defined herein will have the meaning given them in the Act:

(a) *Act* means the Clean Air Act (42 U.S.C. 7401 *et seq.*, as amended by Pub. L. 91-604, 84 Stat. 1676 Pub. L. 95-95, 91 Stat., 685 and Pub. L. 95-190, 91 Stat., 1399.)

(b) *Administrator* means the Administrator of the Environmental Protection Agency (EPA) or an authorized representative.

(c) *Primary standard* means a national primary ambient air quality standard promulgated pursuant to section 109 of the Act.

(d) *Secondary standard* means a national secondary ambient air quality standard promulgated pursuant to section 109 of the Act.

(e) *National standard* means either a primary or secondary standard.

(f) *Owner or operator* means any person who owns, leases, operates, controls, or supervises a facility, building, structure, or installation which directly or indirectly result or may result in emissions of any air pollutant for which a national standard is in effect.

(g) *Local agency* means any local government agency other than the State agency, which is charged with responsibility for carrying out a portion of the plan.

(h) *Regional Office* means one of the ten (10) EPA Regional Offices.

(i) *State agency* means the air pollution control agency primarily responsible for development and implementation of a plan under the Act.

(j) *Plan* means an implementation plan approved or promulgated under section 110 of 172 of the Act.

(k) *Point source* means the following:

(1) For particulate matter, sulfur oxides, carbon monoxide, volatile organic compounds (VOC) and nitrogen dioxide—

(i) Any stationary source the actual emissions of which are in excess of 90.7 metric tons (100 tons) per year of the pollutant in a region containing an area whose 1980 *urban place* population, as defined by the U.S. Bureau of the Census, was equal to or greater than 1 million.

(ii) Any stationary source the actual emissions of which are in excess of 22.7 metric tons (25 tons) per year of the pollutant in a region containing an area whose 1980 *urban place* population, as defined by the U.S. Bureau of the Census, was less than 1 million; or

(2) For lead or lead compounds measured as elemental lead, any stationary

§51.100

source that actually emits a total of 4.5 metric tons (5 tons) per year or more.

(l) *Area source* means any small residential, governmental, institutional, commercial, or industrial fuel combustion operations; onsite solid waste disposal facility; motor vehicles, aircraft vessels, or other transportation facilities or other miscellaneous sources identified through inventory techniques similar to those described in the "AEROS Manual series, Vol. II AEROS User's Manual," EPA-450/2-76-029 December 1976.

(m) *Region* means an area designated as an air quality control region (AQCR) under section 107(c) of the Act.

(n) *Control strategy* means a combination of measures designated to achieve the aggregate reduction of emissions necessary for attainment and maintenance of national standards including, but not limited to, measures such as:

(1) Emission limitations.

(2) Federal or State emission charges or taxes or other economic incentives or disincentives.

(3) Closing or relocation of residential, commercial, or industrial facilities.

(4) Changes in schedules or methods of operation of commercial or industrial facilities or transportation systems, including, but not limited to, short-term changes made in accordance with standby plans.

(5) Periodic inspection and testing of motor vehicle emission control systems, at such time as the Administrator determines that such programs are feasible and practicable.

(6) Emission control measures applicable to in-use motor vehicles, including, but not limited to, measures such as mandatory maintenance, installation of emission control devices, and conversion to gaseous fuels.

(7) Any transportation control measures including those transportation measures listed in section 108(f) of the Clean Air Act as amended.

(8) Any variation of, or alternative to any measure delineated herein.

(9) Control or prohibition of a fuel or fuel additive used in motor vehicles, if such control or prohibition is necessary to achieve a national primary or secondary air quality standard and is

approved by the Administrator under section 211(c)(4)(C) of the Act.

(o) *Reasonably available control technology (RACT)* means devices, systems, process modifications, or other apparatus or techniques that are reasonably available taking into account:

(1) The necessity of imposing such controls in order to attain and maintain a national ambient air quality standard;

(2) The social, environmental, and economic impact of such controls; and

(3) Alternative means of providing for attainment and maintenance of such standard. (This provision defines RACT for the purposes of §51.110(c)(2) and 51.341(b) only.)

(p) *Compliance schedule* means the date or dates by which a source or category of sources is required to comply with specific emission limitations contained in an implementation plan and with any increments of progress toward such compliance.

(q) *Increments of progress* means steps toward compliance which will be taken by a specific source, including:

(1) Date of submittal of the source's final control plan to the appropriate air pollution control agency;

(2) Date by which contracts for emission control systems or process modifications will be awarded; or date by which orders will be issued for the purchase of component parts to accomplish emission control or process modification;

(3) Date of initiation of on-site construction or installation of emission control equipment or process change;

(4) Date by which on-site construction or installation of emission control equipment or process modification is to be completed; and

(5) Date by which final compliance is to be achieved.

(r) *Transportation control measure* means any measure that is directed toward reducing emissions of air pollutants from transportation sources. Such measures include, but are not limited to, those listed in section 108(f) of the Clean Air Act.

(s) *Volatile organic compounds (VOC)* means any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate,

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which participates in atmospheric photochemical reactions.

(1) This includes any such organic compound other than the following, which have been determined to have negligible photochemical reactivity: methane; ethane; methylene chloride (dichloromethane); 1,1,1-trichloroethane (methyl chloroform); 1,1,2-trichloro-1,2,2-trifluoroethane (CFC-113); trichlorofluoromethane (CFC-11); dichlorodifluoromethane (CFC-12); chlorodifluoromethane (HCFC-22); trifluoromethane (HFC-23); 1,2-dichloro 1,1,2,2-tetrafluoroethane (CFC-114); chloropentafluoroethane (CFC-115); 1,1,1-trifluoro 2,2-dichloroethane (HCFC-123); 1,1,1,2-tetrafluoroethane (HFC-134a); 1,1-dichloro 1-fluoroethane (HCFC-141b); 1-chloro 1,1-difluoroethane (HCFC-142b); 2-chloro-1,1,1,2-tetrafluoroethane (HCFC-124); pentafluoroethane (HFC-125); 1,1,2,2-tetrafluoroethane (HFC-134); 1,1,1-trifluoroethane (HFC-143a); 1,1-difluoroethane (HFC-152a); parachlorobenzotrifluoride (PCBTf); cyclic, branched, or linear completely methylated siloxanes; acetone; perchloroethylene (tetrachloroethylene); 3,3-dichloro-1,1,1,2,2-pentafluoropropane (HCFC-225ca); 1,3-dichloro-1,1,2,2,3-pentafluoropropane (HCFC-225cb); 1,1,1,2,3,4,4,5,5,5-decafluoropentane (HFC 43-10mee); and perfluorocarbon compounds which fall into these classes:

(i) Cyclic, branched, or linear, completely fluorinated alkanes,

(ii) Cyclic, branched, or linear, completely fluorinated ethers with no unsaturations,

(iii) Cyclic, branched, or linear, completely fluorinated tertiary amines with no unsaturations, and

(iv) Sulfur containing perfluorocarbons with no unsaturations and with sulfur bonds only to carbon and fluorine.

(2) For purposes of determining compliance with emissions limits, VOC will be measured by the test methods in the approved State implementation plan (SIP) or 40 CFR part 60, appendix A, as applicable. Where such a method also measures compounds with negligible photochemical reactivity, these negligibility-reactive compounds may

be excluded as VOC if the amount of such compounds is accurately quantified, and such exclusion is approved by the enforcement authority.

(3) As a precondition to excluding these compounds as VOC or at any time thereafter, the enforcement authority may require an owner or operator to provide monitoring or testing methods and results demonstrating, to the satisfaction of the enforcement authority, the amount of negligibly-reactive compounds in the source's emissions.

(4) For purposes of Federal enforcement for a specific source, the EPA shall use the test methods specified in the applicable EPA-approved SIP, in a permit issued pursuant to a program approved or promulgated under title V of the Act, or under 40 CFR part 51, subpart I or appendix S, or under 40 CFR parts 52 or 60. The EPA shall not be bound by any State determination as to appropriate methods for testing or monitoring negligibly-reactive compounds if such determination is not reflected in any of the above provisions.

(t)-(w) [Reserved]

(x) *Time period* means any period of time designated by hour, month, season, calendar year, averaging time, or other suitable characteristics, for which ambient air quality is estimated.

(y) *Variance* means the temporary deferral of a final compliance date for an individual source subject to an approved regulation, or a temporary change to an approved regulation as it applies to an individual source.

(z) *Emission limitation and emission standard* mean a requirement established by a State, local government, or the Administrator which limits the quantity, rate, or concentration of emissions of air pollutants on a continuous basis, including any requirements which limit the level of opacity, prescribe equipment, set fuel specifications, or prescribe operation or maintenance procedures for a source to assure continuous emission reduction.

(aa) *Capacity factor* means the ratio of the average load on a machine or equipment for the period of time considered to the capacity rating of the machine or equipment.

(bb) *Excess emissions* means emissions of an air pollutant in excess of an emission standard.

(cc) *Nitric acid plant* means any facility producing nitric acid 30 to 70 percent in strength by either the pressure or atmospheric pressure process.

(dd) *Sulfuric acid plant* means any facility producing sulfuric acid by the contact process by burning elemental sulfur, alkylation acid, hydrogen sulfide, or acid sludge, but does not include facilities where conversion to sulfuric acid is utilized primarily as a means of preventing emissions to the atmosphere of sulfur dioxide or other sulfur compounds.

(ee) *Fossil fuel-fired steam generator* means a furnace or boiler used in the process of burning fossil fuel for the primary purpose of producing steam by heat transfer.

(ff) *Stack* means any point in a source designed to emit solids, liquids, or gases into the air, including a pipe or duct but not including flares.

(gg) *A stack in existence* means that the owner or operator had (1) begun, or caused to begin, a continuous program of physical on-site construction of the stack or (2) entered into binding agreements or contractual obligations, which could not be cancelled or modified without substantial loss to the owner or operator, to undertake a program of construction of the stack to be completed within a reasonable time.

(hh)(1) *Dispersion technique* means any technique which attempts to affect the concentration of a pollutant in the ambient air by:

(i) Using that portion of a stack which exceeds good engineering practice stack height;

(ii) Varying the rate of emission of a pollutant according to atmospheric conditions or ambient concentrations of that pollutant; or

(iii) Increasing final exhaust gas plume rise by manipulating source process parameters, exhaust gas parameters, stack parameters, or combining exhaust gases from several existing stacks into one stack; or other selective handling of exhaust gas streams so as to increase the exhaust gas plume rise.

(2) The preceding sentence does not include:

(i) The reheating of a gas stream, following use of a pollution control system, for the purpose of returning the gas to the temperature at which it was originally discharged from the facility generating the gas stream;

(ii) The merging of exhaust gas streams where:

(A) The source owner or operator demonstrates that the facility was originally designed and constructed with such merged gas streams;

(B) After July 8, 1985 such merging is part of a change in operation at the facility that includes the installation of pollution controls and is accompanied by a net reduction in the allowable emissions of a pollutant. This exclusion from the definition of *dispersion techniques* shall apply only to the emission limitation for the pollutant affected by such change in operation; or

(C) Before July 8, 1985, such merging was part of a change in operation at the facility that included the installation of emissions control equipment or was carried out for sound economic or engineering reasons. Where there was an increase in the emission limitation or, in the event that no emission limitation was in existence prior to the merging, an increase in the quantity of pollutants actually emitted prior to the merging, the reviewing agency shall presume that merging was significantly motivated by an intent to gain emissions credit for greater dispersion. Absent a demonstration by the source owner or operator that merging was not significantly motivated by such intent, the reviewing agency shall deny credit for the effects of such merging in calculating the allowable emissions for the source;

(iii) Smoke management in agricultural or silvicultural prescribed burning programs;

(iv) Episodic restrictions on residential woodburning and open burning; or

(v) Techniques under §51.100(hh)(1)(iii) which increase final exhaust gas plume rise where the resulting allowable emissions of sulfur dioxide from the facility do not exceed 5,000 tons per year.

(ii) *Good engineering practice (GEP)* stack height means the greater of:

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# Environmental Protection Agency

§ 51.100

(1) 65 meters, measured from the ground-level elevation at the base of the stack:

(2)(i) For stacks in existence on January 12, 1979, and for which the owner or operator had obtained all applicable permits or approvals required under 40 CFR parts 51 and 52.

$$H_p = 2.5H_s$$

provided the owner or operator produces evidence that this equation was actually relied on in establishing an emission limitation:

(ii) For all other stacks,

$$H_p = H + 1.5L$$

where

$H_s$  = good engineering practice stack height, measured from the ground-level elevation at the base of the stack,

$H$  = height of nearby structure(s) measured from the ground-level elevation at the base of the stack.

$L$  = lesser dimension, height or projected width, of nearby structure(s)

provided that the EPA, State or local control agency may require the use of a field study or fluid model to verify GEP stack height for the source; or

(3) The height demonstrated by a fluid model or a field study approved by the EPA State or local control agency, which ensures that the emissions from a stack do not result in excessive concentrations of any air pollutant as a result of atmospheric downwash, wakes, or eddy effects created by the source itself, nearby structures or nearby terrain features.

(ii) *Nearby* as used in § 51.100(ii) of this part is defined for a specific structure or terrain feature and

(1) For purposes of applying the formulae provided in § 51.100(ii)(2) means that distance up to five times the lesser of the height or the width dimension of a structure, but not greater than 0.8 km (½ mile), and

(2) For conducting demonstrations under § 51.100(ii)(3) means not greater than 0.8 km (½ mile), except that the portion of a terrain feature may be considered to be nearby which falls within a distance of up to 10 times the maximum height ( $H_t$ ) of the feature, not to exceed 2 miles if such feature achieves a height ( $H_t$ ) 0.8 km from the stack that is at least 40 percent of the GEP stack height determined by the formulae provided in § 51.100(ii)(2)(ii) of

this part or 26 meters, whichever is greater, as measured from the ground-level elevation at the base of the stack. The height of the structure or terrain feature is measured from the ground-level elevation at the base of the stack.

(kk) *Excessive concentration* is defined for the purpose of determining good engineering practice stack height under § 51.100(ii)(3) and means:

(1) For sources seeking credit for stack height exceeding that established under § 51.100(ii)(2) a maximum ground-level concentration due to emissions from a stack due in whole or part to downwash, wakes, and eddy effects produced by nearby structures or nearby terrain features which individually is at least 40 percent in excess of the maximum concentration experienced in the absence of such downwash, wakes, or eddy effects and which contributes to a total concentration due to emissions from all sources that is greater than an ambient air quality standard. For sources subject to the prevention of significant deterioration program (40 CFR 51.166 and 52.21), an excessive concentration alternatively means a maximum ground-level concentration due to emissions from a stack due in whole or part to downwash, wakes, or eddy effects produced by nearby structures or nearby terrain features which individually is at least 40 percent in excess of the maximum concentration experienced in the absence of such downwash, wakes, or eddy effects and greater than a prevention of significant deterioration increment. The allowable emission rate to be used in making demonstrations under this part shall be prescribed by the new source performance standard that is applicable to the source category unless the owner or operator demonstrates that this emission rate is infeasible. Where such demonstrations are approved by the authority administering the State implementation plan, an alternative emission rate shall be established in consultation with the source owner or operator.

(2) For sources seeking credit after October 11, 1983, for increases in existing stack heights up to the heights established under § 51.100(ii)(2), either (i) a maximum ground-level concentration

## §51.101

due in whole or part to downwash, wakes or eddy effects as provided in paragraph (kk)(1) of this section, except that the emission rate specified by any applicable State implementation plan (or, in the absence of such a limit, the actual emission rate) shall be used, or (ii) the actual presence of a local nuisance caused by the existing stack, as determined by the authority administering the State implementation plan; and

(3) For sources seeking credit after January 12, 1979 for a stack height determined under §51.100(ii)(2) where the authority administering the State implementation plan requires the use of a field study or fluid model to verify GEP stack height, for sources seeking stack height credit after November 9, 1984 based on the aerodynamic influence of cooling towers, and for sources seeking stack height credit after December 31, 1970 based on the aerodynamic influence of structures not adequately represented by the equations in §51.100(ii)(2), a maximum ground-level concentration due in whole or part to downwash, wakes or eddy effects that is at least 40 percent in excess of the maximum concentration experienced in the absence of such downwash, wakes, or eddy effects.

(ll)-(mm) [Reserved]

(nn) Intermittent control system (ICS) means a dispersion technique which varies the rate at which pollutants are emitted to the atmosphere according to meteorological conditions and/or ambient concentrations of the pollutant, in order to prevent ground-level concentrations in excess of applicable ambient air quality standards. Such a dispersion technique is an ICS whether used alone, used with other dispersion techniques, or used as a supplement to continuous emission controls (i.e., used as a supplemental control system).

(oo) *Particulate matter* means any airborne finely divided solid or liquid material with an aerodynamic diameter smaller than 100 micrometers.

(pp) *Particulate matter emissions* means all finely divided solid or liquid material, other than uncombined water, emitted to the ambient air as measured by applicable reference methods, or an equivalent or alternative method, specified in this chapter, or by a test method specified in an approved State implementation plan.

(qq) *PM<sub>10</sub>* means particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers as measured by a reference method based on appendix J of part 50 of this chapter and designated in accordance with part 53 of this chapter or by an equivalent method designated in accordance with part 53 of this chapter.

(rr) *PM<sub>10</sub> emissions* means finely divided solid or liquid material, with an aerodynamic diameter less than or equal to a nominal 10 micrometers emitted to the ambient air as measured by an applicable reference method, or an equivalent or alternative method, specified in this chapter or by a test method specified in an approved State implementation plan.

(ss) *Total suspended particulate* means particulate matter as measured by the method described in appendix B of part 50 of this chapter.

[51 FR 40661, Nov. 7, 1986, as amended at 52 FR 24712, July 1, 1987; 57 FR 3945, Feb. 3, 1992; 61 FR 4590, Feb. 7, 1996; 61 FR 16060, Apr. 11, 1996; 61 FR 30162, June 14, 1996; 61 FR 52850, Oct. 8, 1996]

## §51.101 Stipulations.

Nothing in this part will be construed in any manner:

(a) To encourage a State to prepare, adopt, or submit a plan which does not provide for the protection and enhancement of air quality so as to promote the public health and welfare and productive capacity.

(b) To encourage a State to adopt any particular control strategy without taking into consideration the cost-effectiveness of such control strategy in relation to that of alternative control strategies.

(c) To preclude a State from employing techniques other than those specified in this part for purposes of estimating air quality or demonstrating the adequacy of a control strategy, provided that such other techniques are shown to be adequate and appropriate for such purposes.

(d) To encourage a State to prepare, adopt, or submit a plan without taking into consideration the social and economic impact of the control strategy

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5. The following comparisons were performed under my direction and supervision.
6. Several hair care compositions were prepared using various solvents in combination with methyl acetate as shown below. Sample series 1 and 2 are aerosol compositions with a VOC propellant. Sample series 3 and 4 are aerosol compositions with a mixture of VOC and non-VOC propellants, with sample 4 being anhydrous. Sample series 5 and 6 are pump (non-aerosol) sprays. The fixative is Resyn 28-2930 with an INCI designation of VA/Crotonates/Vinyl Neodecanoate Copolymer. The neutralizer is aminomethyl propanol.

Sample	1(a)	2(a)	3(a)	4(a)	5(a)	6(a)
Component*						
Fixative	4.0	4.0	4.0	4.0	4.0	4.0
Neutralizer	0.4	0.4	0.4	0.4	0.4	0.4
Methyl Acetate	5.0	25.0	5.0	25.0	5.0	25.0
Ethanol	20.0	20.0	40.0	39.6	55.0	55.0
Water	35.6	15.6	19.6	0	35.6	15.6
Dimethyl Ether	35.0	35.0	15.0	15.0	-	-
1,1-difluoroethane	-	-	16.0	16.0	-	-

\*Component amounts represent weight percent of total composition

Sample	1(b)	2(b)	3(b)	4(b)	5(b)	6(b)
Component*						
Fixative	4.0	4.0	4.0	4.0	4.0	4.0
Neutralizer	0.4	0.4	0.4	0.4	0.4	0.4
Methyl Acetate	5.0	25.0	5.0	25.0	5.0	25.0
Acetone	20.0	20.0	40.0	39.6	55.0	55.0
Water	35.6	15.6	19.6	0	35.6	15.6
Dimethyl Ether	35.0	35.0	15.0	15.0	-	-
1,1-difluoroethane	-	-	16.0	16.0	-	-

\*Component amounts represent weight percent of total composition

Sample	1(c)	2(c)	3(c)	5(c)	5(c)	6(c)
Component*						
Fixative	4.0	4.0	4.0	4.0	4.0	4.0
Neutralizer	0.4	0.4	0.4	0.4	0.4	0.4
Methyl Acetate	5.0	25.0	5.0	25.0	5.0	25.0
MEK	20.0	20.0	40.0	39.6	55.0	55.0
Water	35.6	15.6	19.6	0	35.6	15.6
Dimethyl Ether	35.0	35.0	15.0	15.0	-	-
1,1-difluoroethane	-	-	16.0	16.0	-	-

\*Component amounts represent weight percent of total composition

Sample Component*	1(d)	2(d)	3(d)	4(d)	5(d)	6(d)
Fixative	4.0	4.0	4.0	4.0	4.0	4.0
Neutralizer	0.4	0.4	0.4	0.4	0.4	0.4
Methyl Acetate	5.0	25.0	5.0	25.0	5.0	25.0
Ethyl Acetate	20.0	20.0	40.0	39.6	55.0	55.0
Water	35.6	15.6	19.6	0	35.6	15.6
Dimethyl Ether	35.0	35.0	15.0	15.0	-	-
1,1-difluoroethane	-	-	16.0	16.0	-	-

\*Component amounts represent weight percent of total composition

7. The following observations were made from the comparative samples.

Observations Sample	Appearance of Sample	Odor from Spray-out	Effect on Acetate Fabric <sup>1</sup>
1(a) Ethanol/ Methyl Acetate	Clear	Milder than 1(b)	Appears unaffected (No visible change)
1(b) Acetone/ Methyl Acetate	Clear	Stronger than 1(a)	More brittle than 1(a)
1(c) MEK/ Methyl Acetate	Milky with increased viscosity <sup>2</sup>	-	-
1(d) Ethyl Acetate/ Methyl Acetate	Milky with increased viscosity <sup>2</sup>	-	-

<sup>1</sup>For all samples, the fixative in the formulation imparts a slight stiffness to the fabric.

<sup>2</sup>Sample is unacceptable due to incompatibility of components. No further testing conducted.

Observations Sample	Appearance of Sample	Odor from Spray-out	Effect on Acetate Fabric <sup>1</sup>
2(a) Ethanol/ Methyl Acetate	Slightly hazy	Milder than 2(b)	Appears unaffected (No visible change)
2(b) Acetone/ Methyl Acetate	Slightly hazy	Stronger than 2(a); stronger organic solvent odor	More brittle than 2(a)
2(c) MEK/ Methyl Acetate	Hazy with small bottom layer <sup>2</sup>	—	—
2(d) Ethyl Acetate/ Methyl Acetate	Cloudy with sediment <sup>2</sup>	—	—

Observations Sample	Appearance of Sample	Odor from Spray-out	Effect on Acetate Fabric <sup>1</sup>
3(a) Ethanol/ Methyl Acetate	Clear	Mild	Appears unaffected (No visible change)
3(b) Acetone/ Methyl Acetate	Incompatible; separates into layers <sup>2</sup>	—	—
3(c) MEK/ Methyl Acetate	Cloudy/milky with two layers <sup>2</sup>	—	—
3(d) Ethyl Acetate/ Methyl Acetate	Milky; separates upon setting <sup>2</sup>	—	—

<sup>1</sup>For all samples, the fixative in the formulation imparts a slight stiffness to the fabric.

<sup>2</sup>Sample is unacceptable due to incompatibility of components. No further testing conducted.

Observations Sample	Appearance of Sample	Odor from Spray-out	Effect on Acetate Fabric <sup>1</sup>
4(a) Ethanol/ Methyl Acetate	Slightly hazy	Mildest	Appears unaffected (No visible change)
4(b) Acetone/ Methyl Acetate	Slightly hazy	Sharper/stronger than 4(a)	Brittle, curls; tears easily
4(c) MEK/ Methyl Acetate	Slightly hazy with slight sediment	Stronger than 4(a)	Brittle; tears easily
4(d) Ethyl Acetate/ Methyl Acetate	Hazy with sediment <sup>2</sup>	—	—

Observations Sample	Appearance of Sample	Odor from Spray-out	Effect on Acetate Fabric <sup>1</sup>
5(a) Ethanol/ Methyl Acetate	Clear	Very mild	Appears unaffected (No visible change)
5(b) Acetone/ Methyl Acetate	Very slightly hazy	Stronger than 5(a)	More brittle than 5(a)
5(c) MEK/ Methyl Acetate	Milky, separated into layers <sup>2</sup>	—	—
5(d) Ethyl Acetate/ Methyl Acetate	Milky with slight sediment <sup>2</sup>	—	—

<sup>1</sup>For all samples, the fixative in the formulation imparts a slight stiffness to the fabric.

<sup>2</sup>Sample is unacceptable due to incompatibility of components. No further testing conducted.

Observations Sample	Appearance of Sample	Odor from Spray-out	Effect on Acetate Fabric <sup>1</sup>
<b>6(a)</b> Ethanol/ Methyl Acetate	Very slightly hazy	Milder, more pleasant than 6(b)	Appears unaffected (No visible change)
<b>6(b)</b> Acetone/ Methyl Acetate	Very slightly hazy	Stronger than 6(a)	Curls; more brittle than 6(a)
<b>6(c)</b> MEK/ Methyl Acetate	Hazy, separated into layers <sup>2</sup>	—	—
<b>6(d)</b> Ethyl Acetate/ Methyl Acetate	Opaque <sup>2</sup>	—	—

<sup>1</sup>For all samples, the fixative in the formulation imparts a slight stiffness to the fabric.

<sup>2</sup>Sample is unacceptable due to incompatibility of components. No further testing conducted.

8. As shown in the comparisons, the odors of the samples containing methyl acetate and ethanol, regardless of the specific weight percentages, were significantly improved relative to those samples containing methyl acetate with a solvent other than ethanol.
9. I believe that a strong, unpleasant odor, hinders consumer acceptance of a consumer hair care product.
10. Since methyl acetate has a characteristic, unpleasant odor, the above results of a substantially reduced, or masked, odor when sprayed from a liquid containing methyl acetate and alcohol were surprising.
11. I believe this surprisingly improved odor would be met with greater consumer acceptance when provided in a consumer product.
12. Further, the effects on acetate fabric of the samples containing methyl acetate and ethanol were significantly improved relative to those samples containing methyl acetate with a solvent other than ethanol.
13. The significantly improved effects when the methyl acetate and ethanol samples were placed in contact with acetate fabric were surprising as in all combinations other than the methyl acetate and ethanol, there are significant detrimental effects to the fabric.

14. It is undesirable to consumers to apply a consumer product that may damage clothing or other fabric that the product may come into contact with. Therefore, this surprisingly improved effect when the combination comes into contact with acetate fabric would be very desirable to consumers.
15. I believe that the improved effects resulting from the combination of ethanol and methyl acetate occur irrespective of the amount of fixative present within the claimed range of 4 – 8 % of the total formulation.
16. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further, that these statements are made with the knowledge that willful, false statements, perjury, and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code and that any such willful, false statement or perjury may jeopardize the validity of the application or any patent issued thereon.

Suzanne Dobbs  
Suzanne Dobbs

2/28/03  
Date